

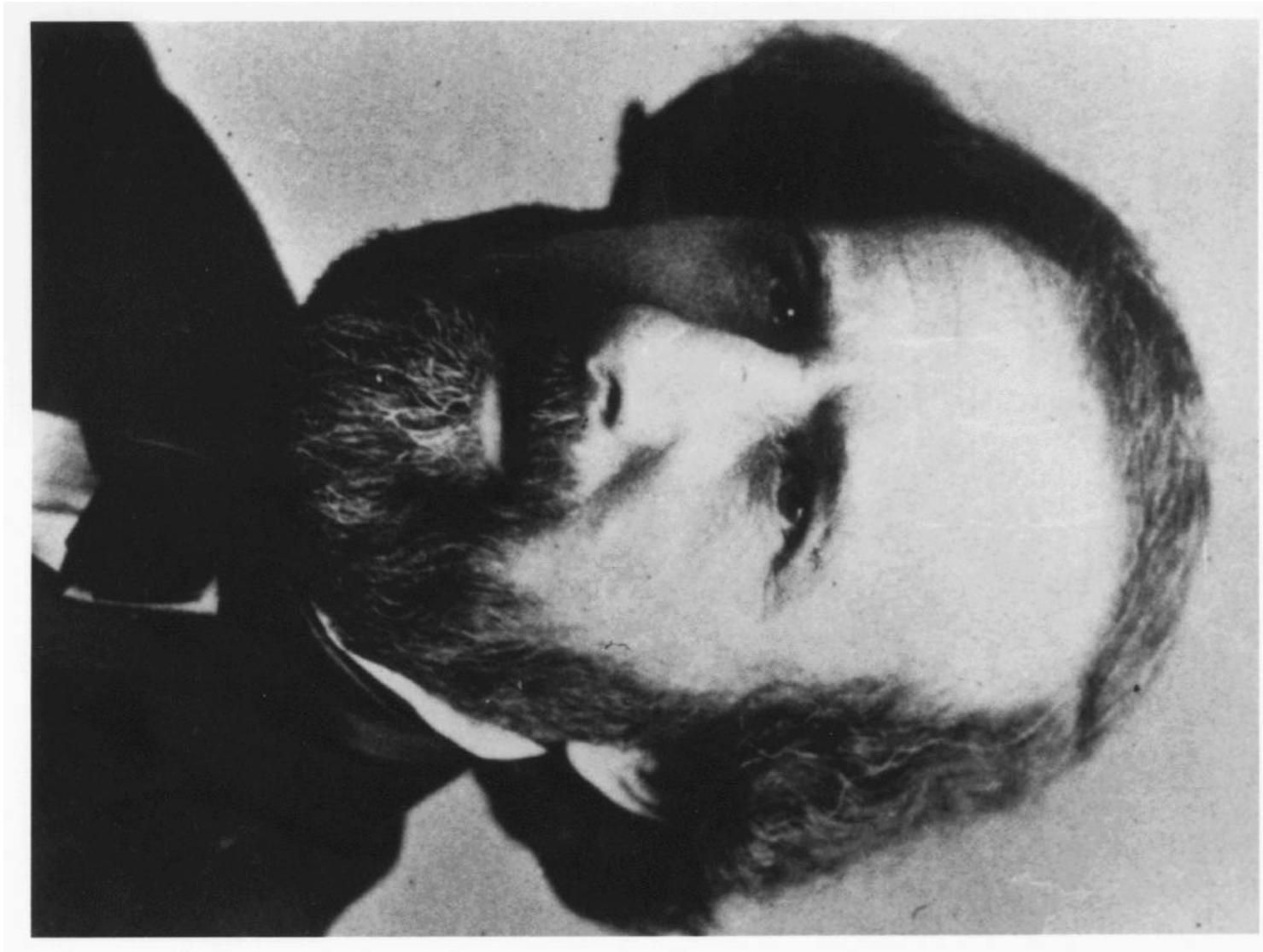
History of Stellar Interferometry

from 1868 to the present

P.R. Lawson

Jet Propulsion Laboratory

4800 Oak Grove Drive
Pasadena, CA 91109



P.R. Lawson - History of Stellar Interferometry

PRIX BORDIN.

QUESTION PROPOSÉE EN 1865 POUR 1867.

(Commissaires : MM. Duhamel, Pouillet, Regnault, Bertrand,
Edmond Becquerel, Fizeau rapporteur.)

Rapport sur le Concours de l'année 1887.

« Le prix sera décerné au savant qui aura exécuté ou proposé une expérience décisive permettant de trancher définitivement la question déjà plusieurs fois étudiée de la direction des vibrations de l'éther dans les rayons polarisés. »

Il existe en effet pour la plupart des phénomènes d'interférence, tels que les franges d'Yung, celles des miroirs de Fresnel et celles qui donnent lieu à la scintillation des étoiles d'après Arago, une relation remarquable et nécessaire entre la dimension des franges et celle de la source lumineuse, en sorte que des franges d'une ténuité extrême ne peuvent prendre naissance que lorsque la source de lumière n'a plus que des dimensions angulaires presque insensibles ; d'où, pour le dire en passant, il est peut-être permis d'espérer qu'en s'appuyant sur ce principe et en formant par exemple, au moyen de deux larges fentes très-écartées, des franges d'interférence au foyer des grands instruments destinés à observer les étoiles, il deviendra possible d'obtenir quelques données nouvelles sur les diamètres angulaires de ces astres.

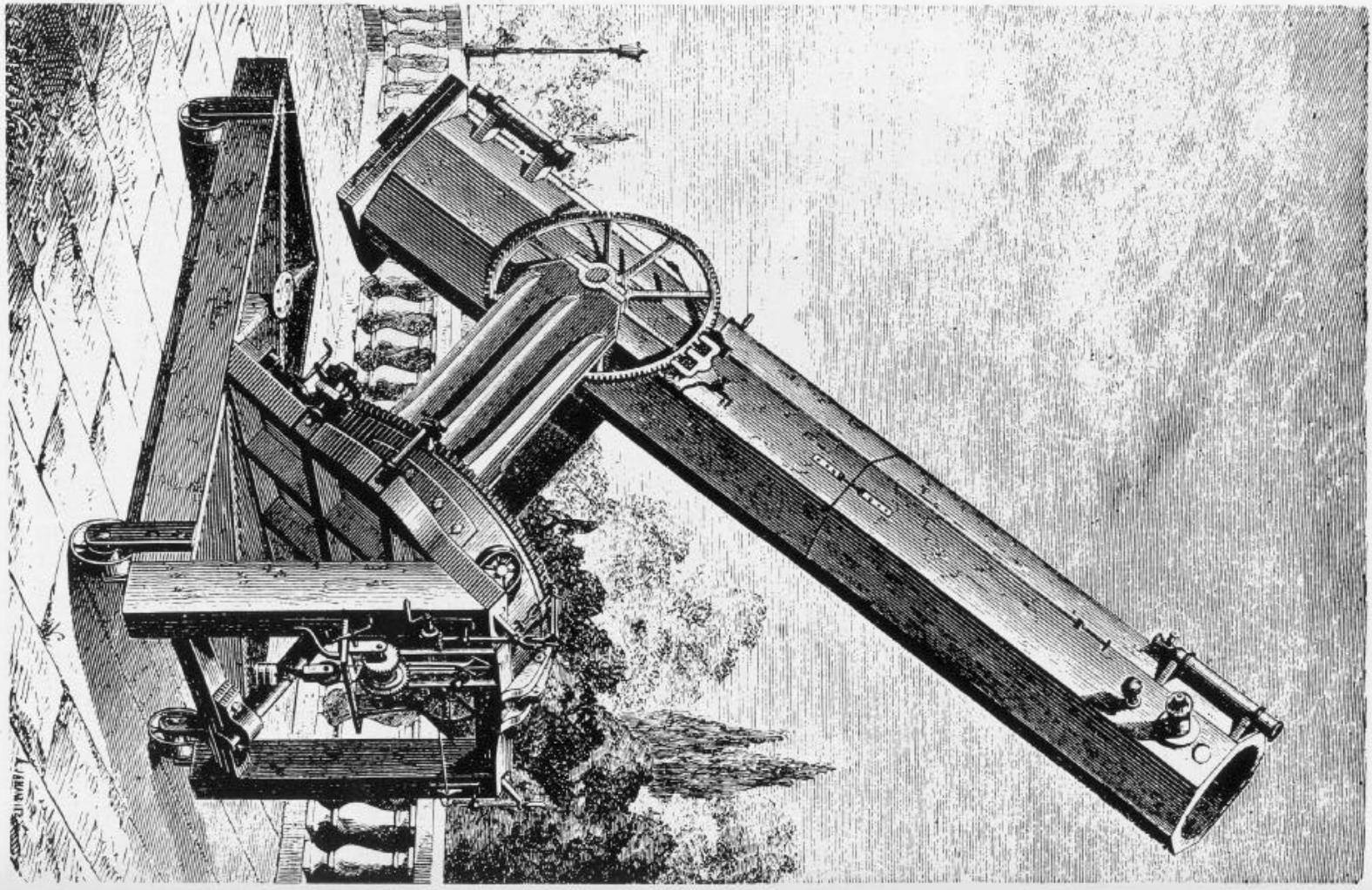


Fig. 5.8. Foucault's largest (80 cm) silver-on-glass reflector, completed in 1862 (reproduced from King [5.2])



Edouard Stephan (1837-1923)





Michelson in 1887, at the time of the
Michelson-Morley experiment

(COURTESY CLARK UNIVERSITY ARCHIVES)

With this apparatus the satellites of Jupiter were measured,
with results as given in the following table:—

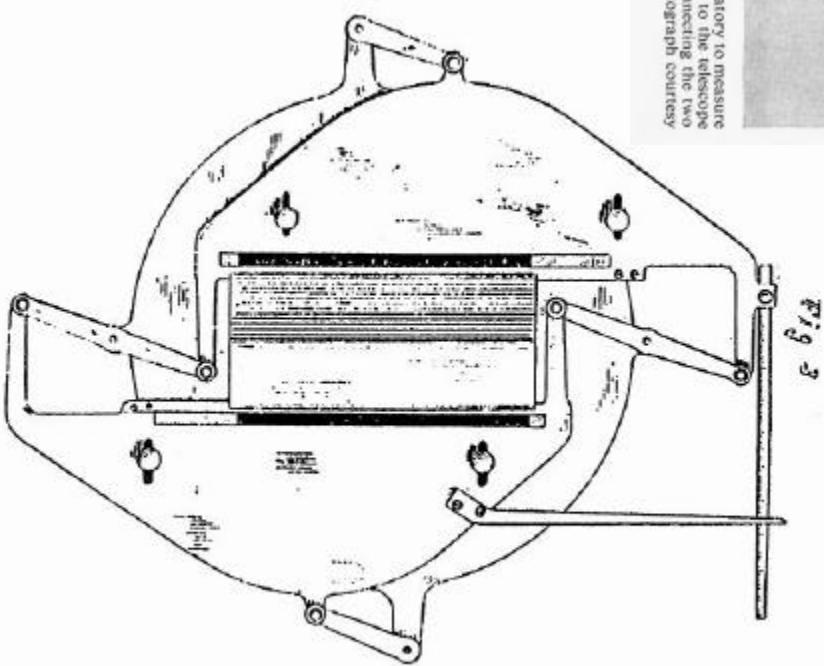
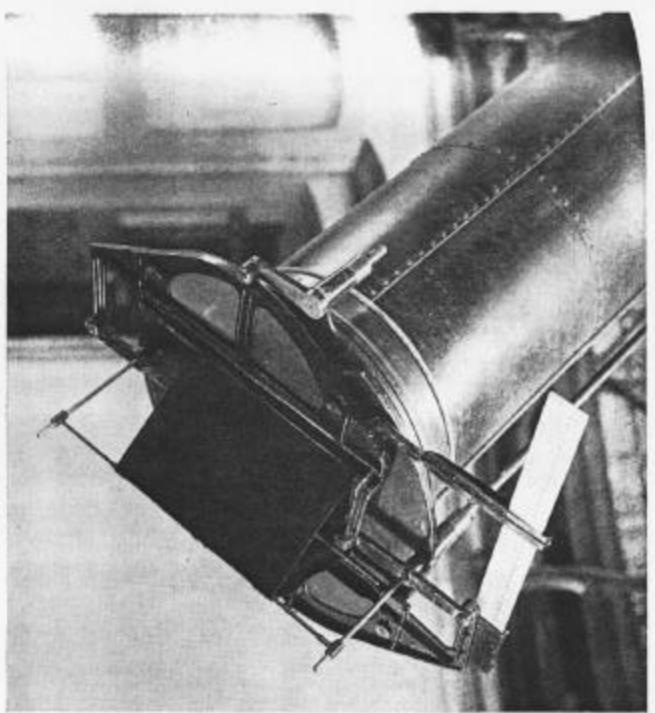
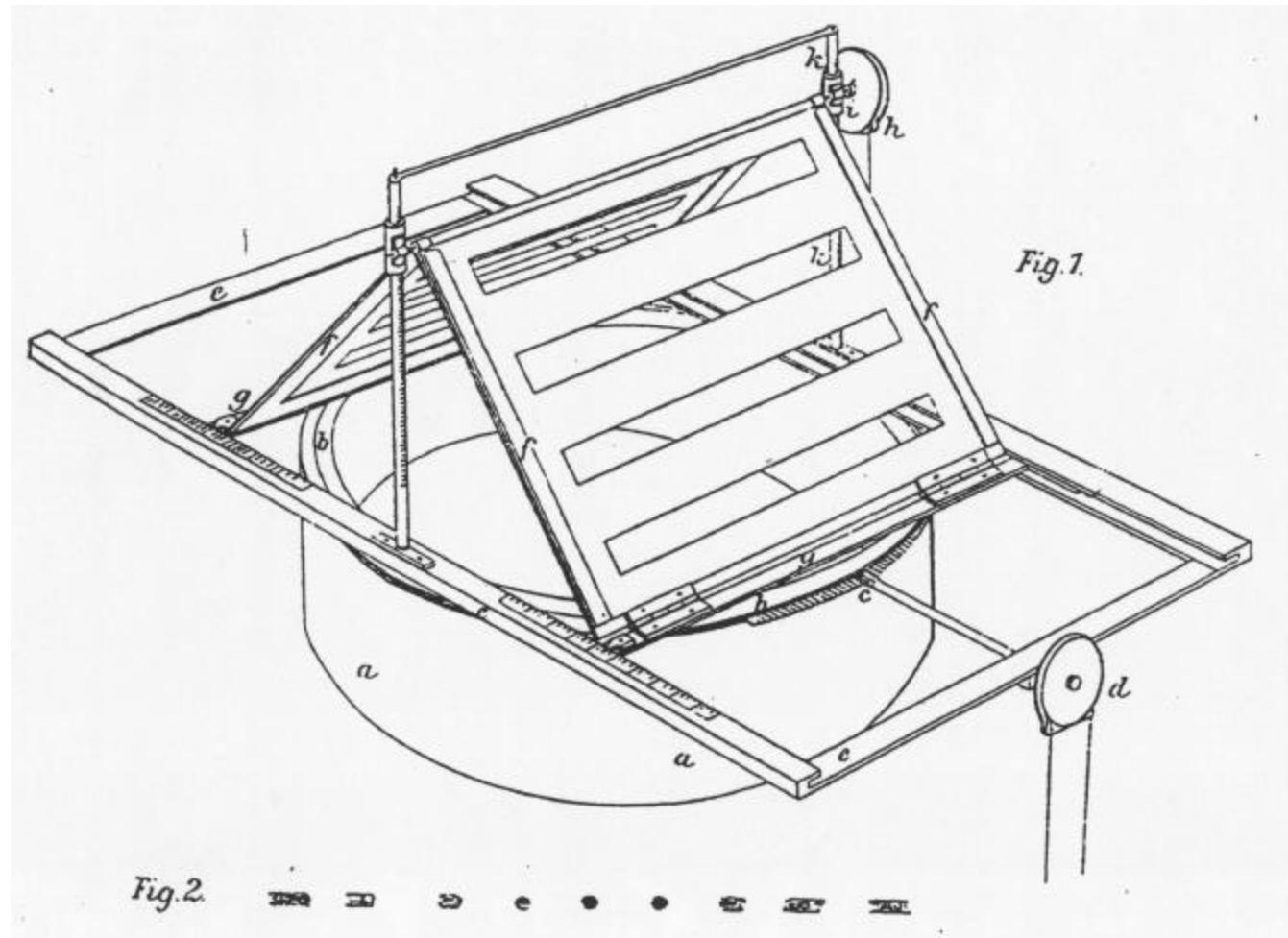


FIG. 1. Interferometric mask used on the 12-inch refractor at Lick Observatory to measure the angular diameters of the Jovian satellites. The rod adjacent to the telescope tube is turned by the observer, which in turn rotates a lever connecting the two slits immediately exterior to the pictured objective shroud. Photograph courtesy University of California at Santa Cruz Library.





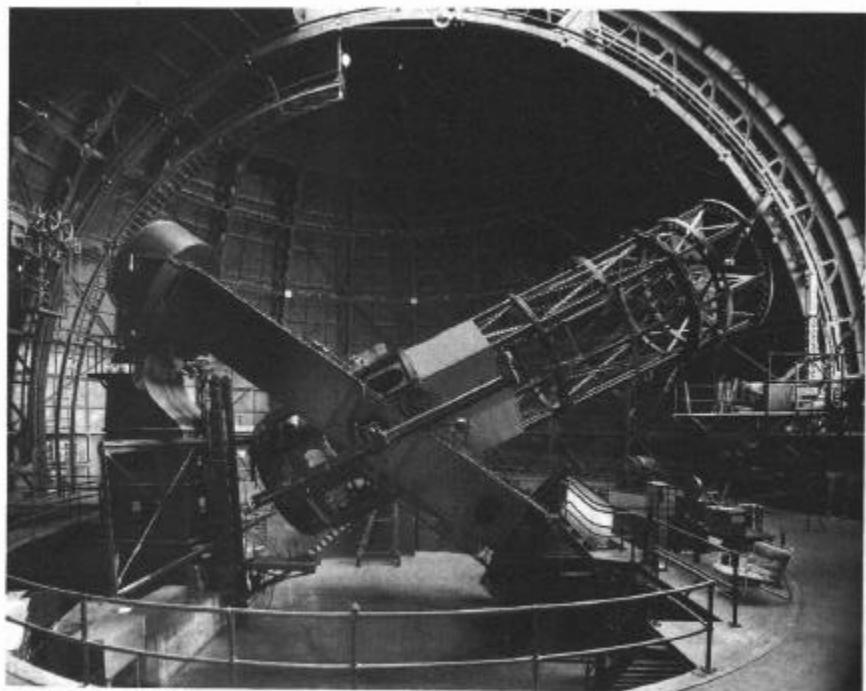


Figure 13.5 The 100 inch (2.5 m) Hooker reflector on Mount Wilson, completed in 1917. (Courtesy The Observatories of the Carnegie Institution of Washington.)



Albert A. Michelson, circa 1918

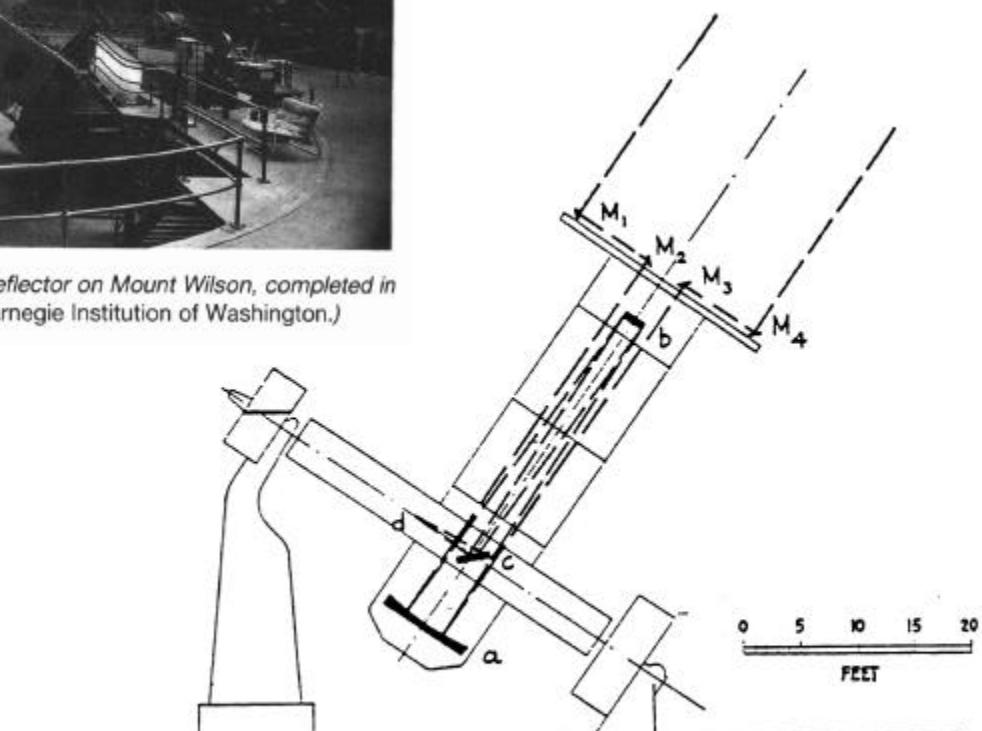


FIG. 1.—Diagram of optical path of interferometer pencils. M_1, M_2, M_3, M_4 , mirrors; a , 100-inch paraboloid; b , convex mirror; c , coudé flat; d , focus.

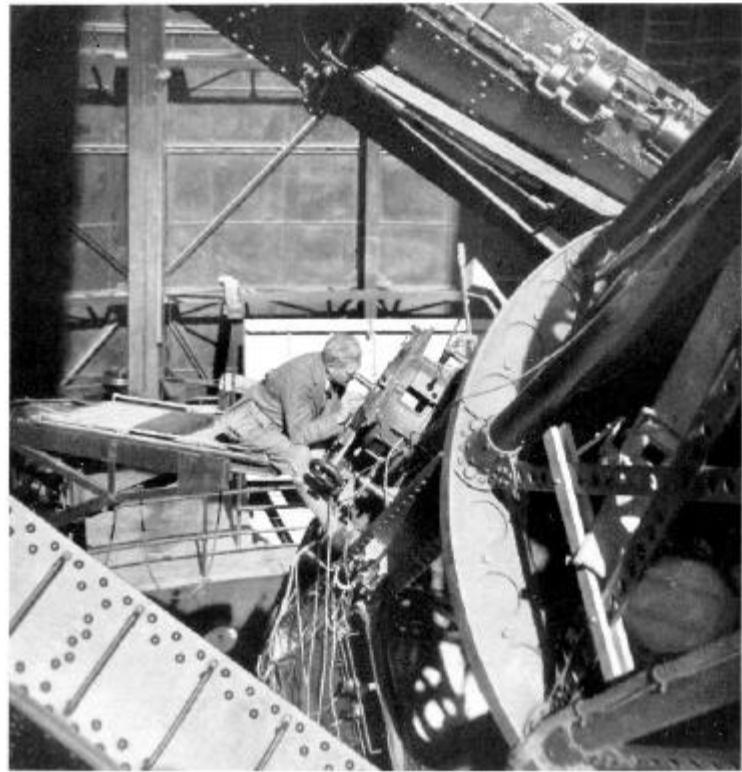


Abb. 3. Showing observer at eyepiece of 20 foot interferometer.

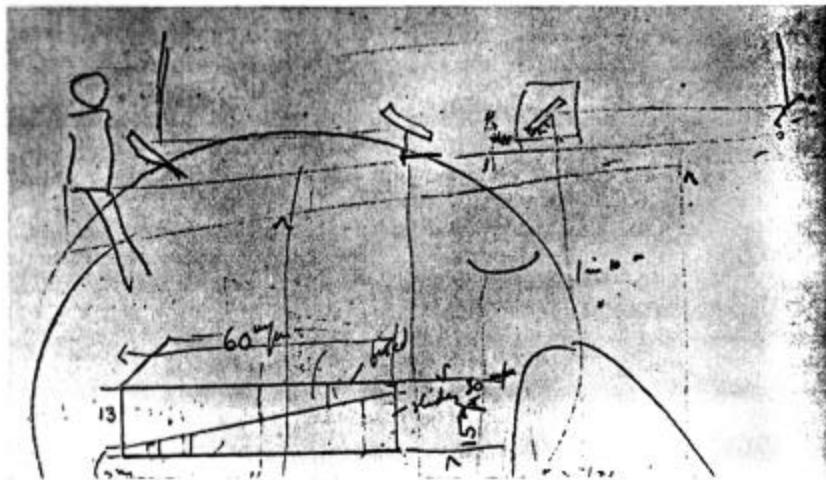
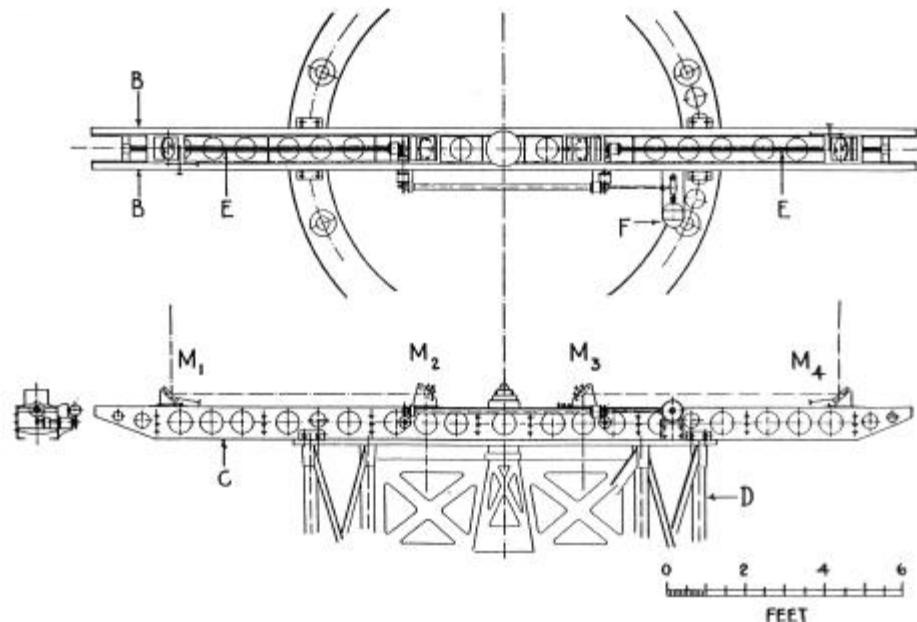


FIG. 3. From F. G. Pease, Notebook 1, sheet 42; approximate date 14 July 1920 (Hale Observatories, copy in Michelson Museum). Crude drawings of the optical wedge used to equalise path length. Note the superimposed sketch illustrating how the night assistant must be perched to move the mirrors on the beam. This situation was necessary because the mirrors, at first, were not continuously adjustable.

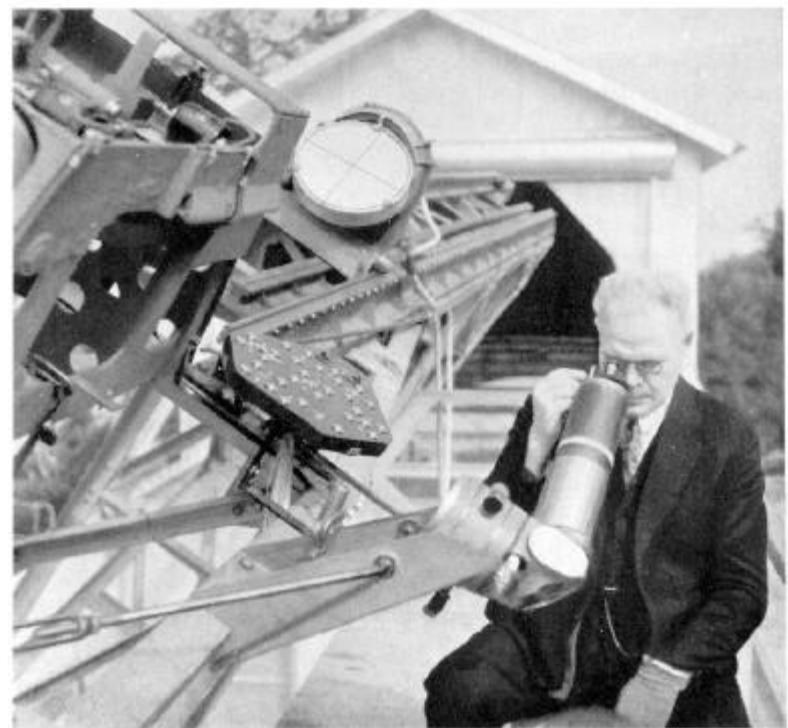
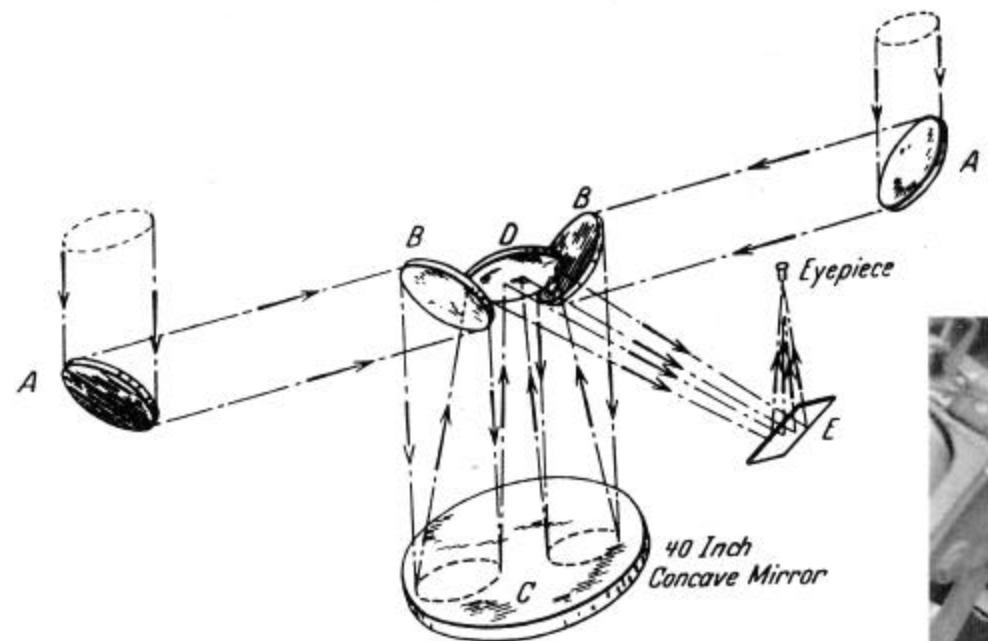


Abb. 9. Upper part of interferometer showing control board and observer at eyepiece.

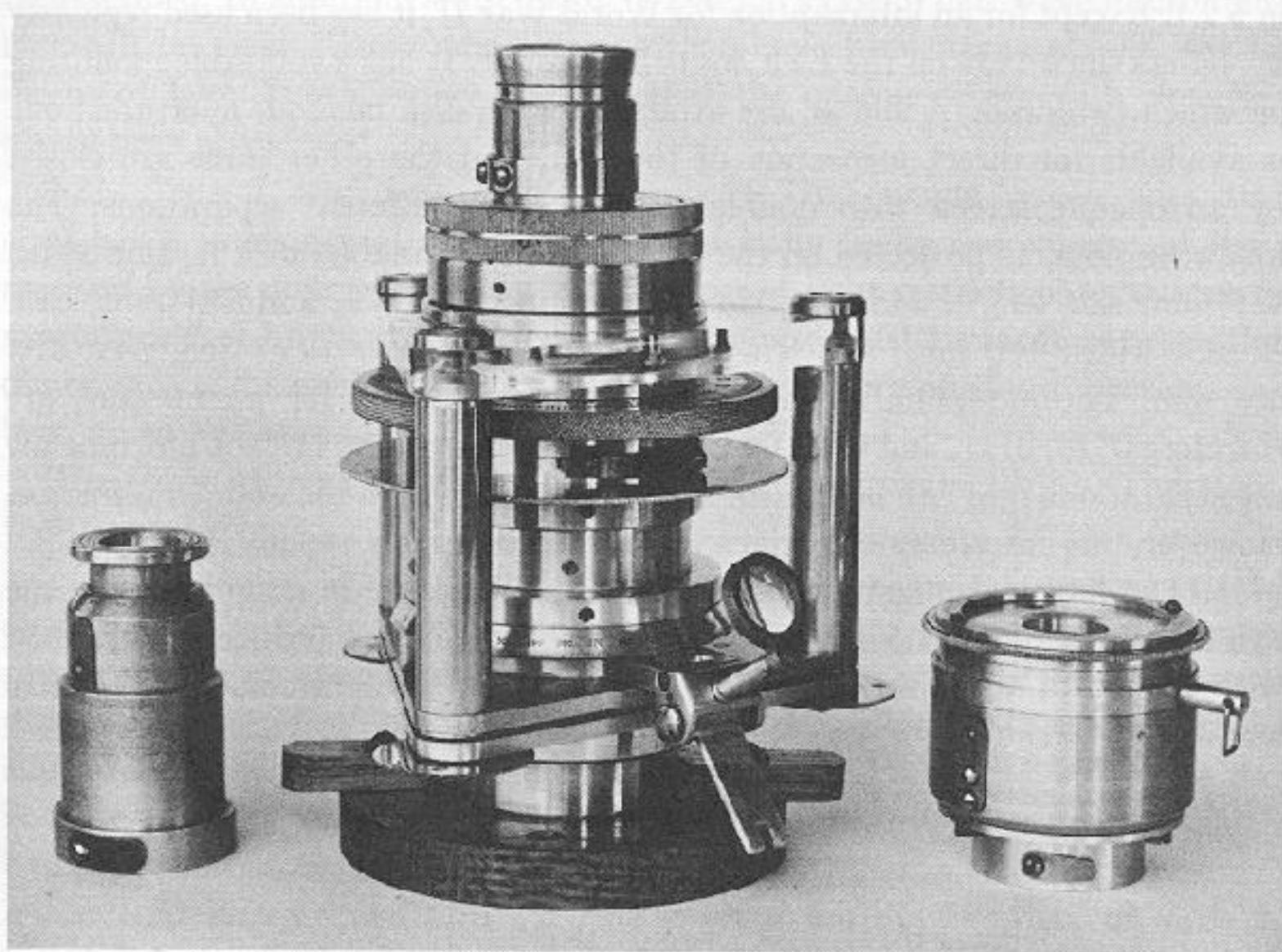


FIG. 9.—The eyepiece interferometer of the Union Observatory

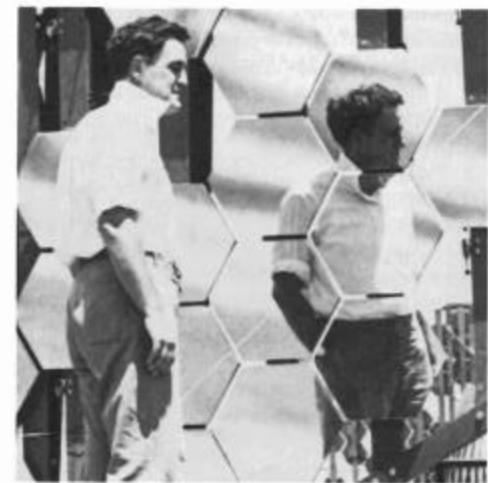
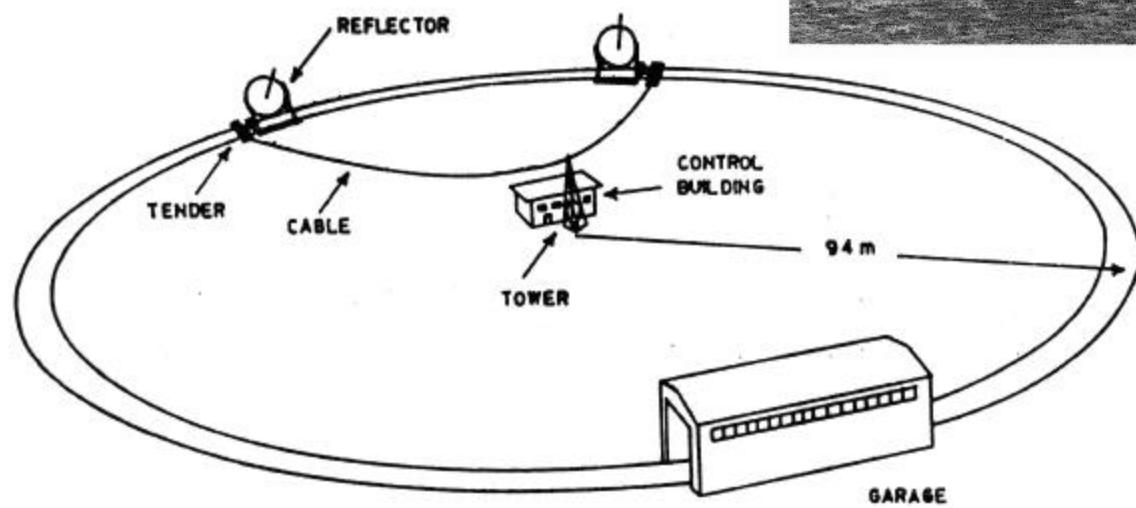
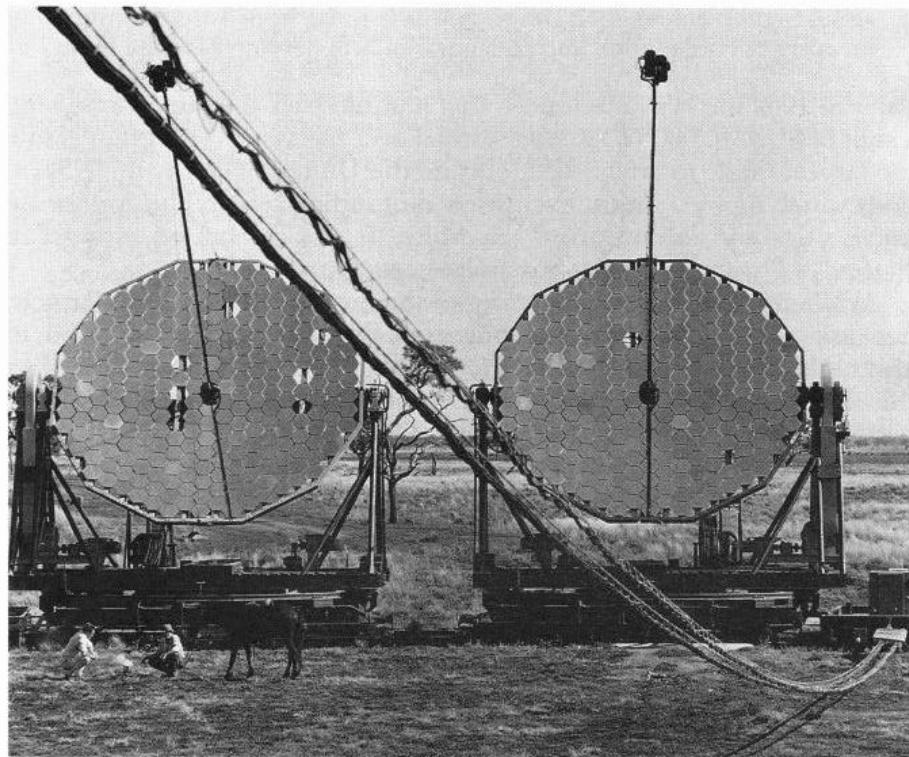
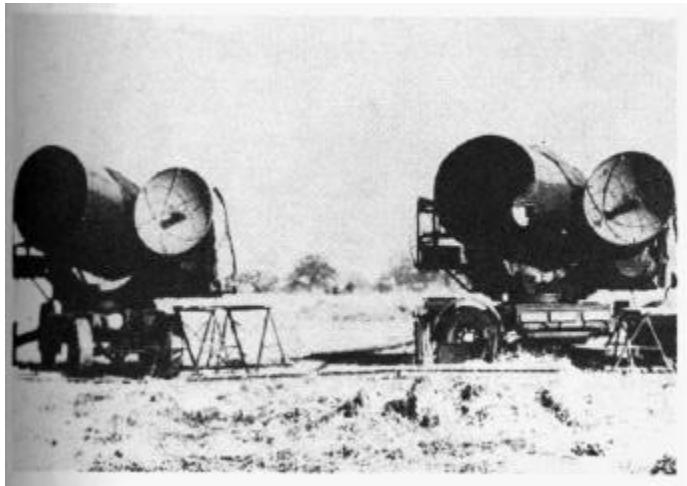
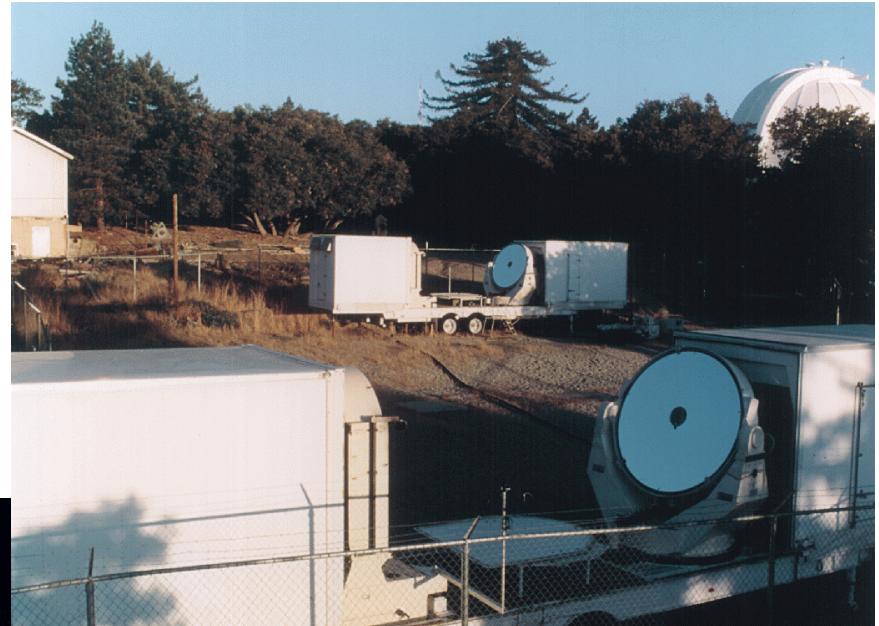


FIG. 7. The general layout of the interferometer at Narrabri Observatory.



Infrared Spatial Interferometer (ISI)

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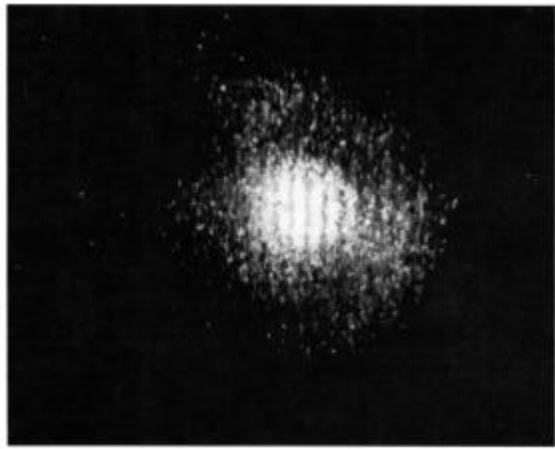


FIG. 4.—Diffraction fringes (photographed from a television receiver), obtained in the image of Vega with 580 Å bandwidth. In this case, the photomultiplier current is operating at reduced gain in the imaging mode. Individual photon events are nevertheless visible as bright points.

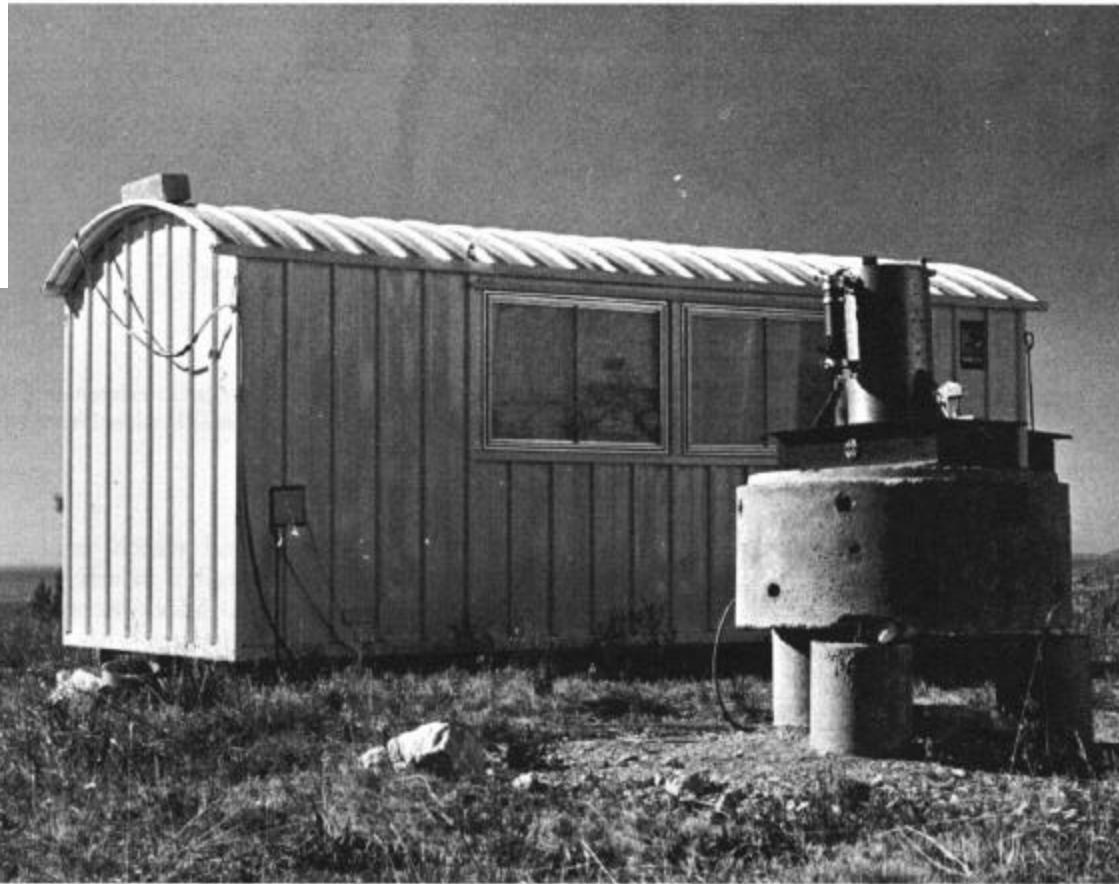
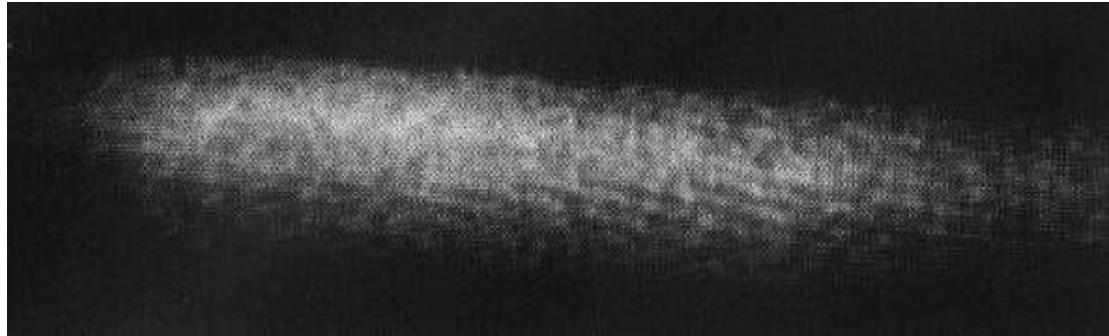
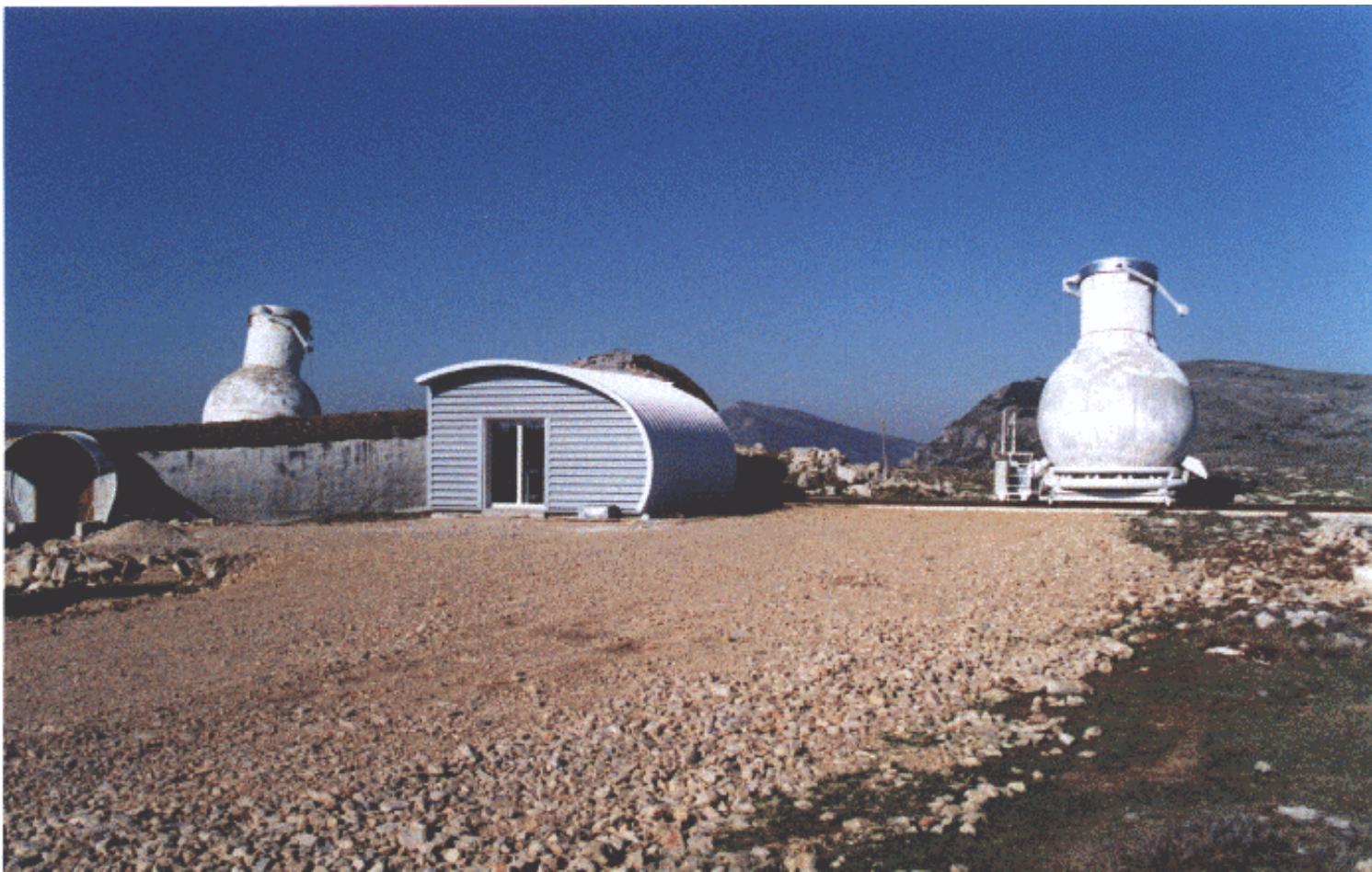
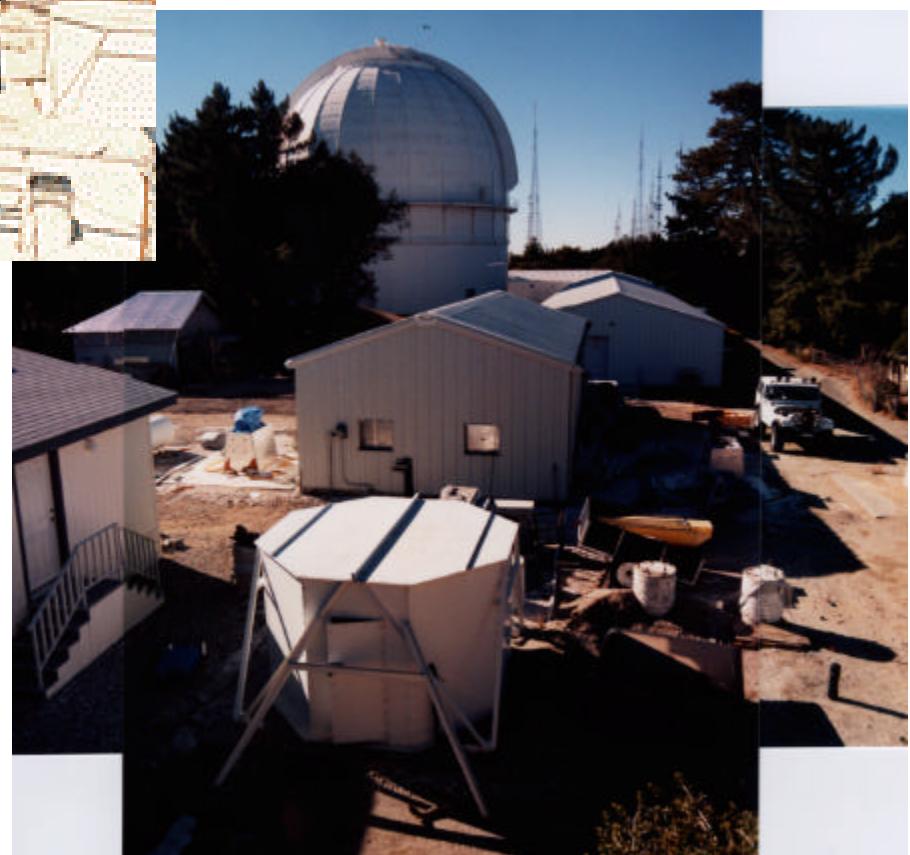
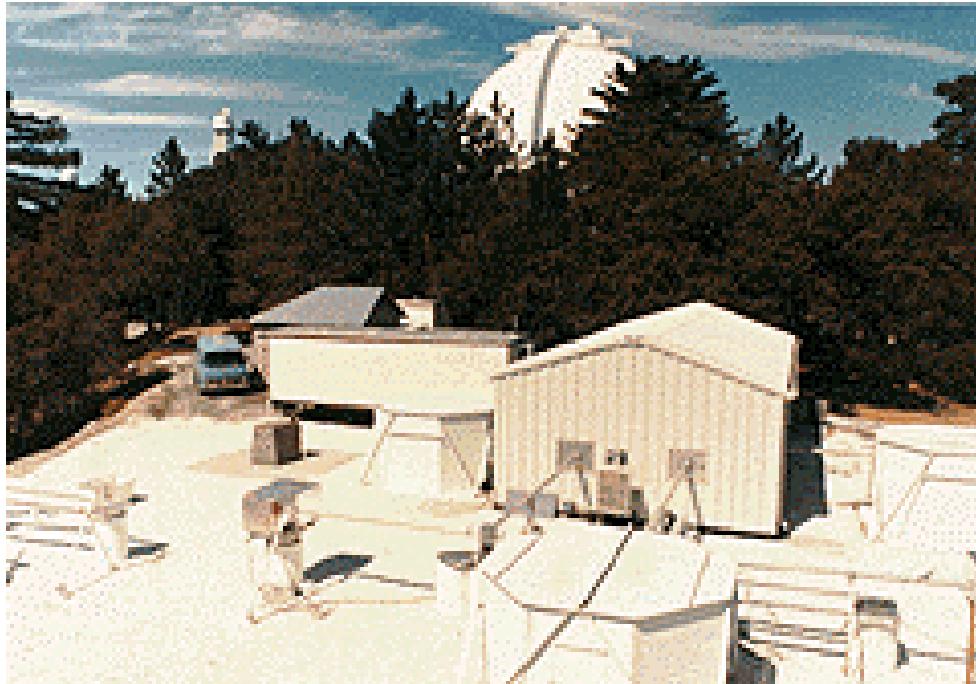


FIG. 2.—Interferometer at Nice observatory, showing the heavy alt-alt yoke mounts with their servo drives. The large concrete elements are commercial pipe sections providing a stable but movable substrate. Not visible is a mechanism which rotates the coudé mirror at half the declination rate, thus providing a fixed coudé output. The construction of 60-m tracks is currently undertaken for a variable baseline.

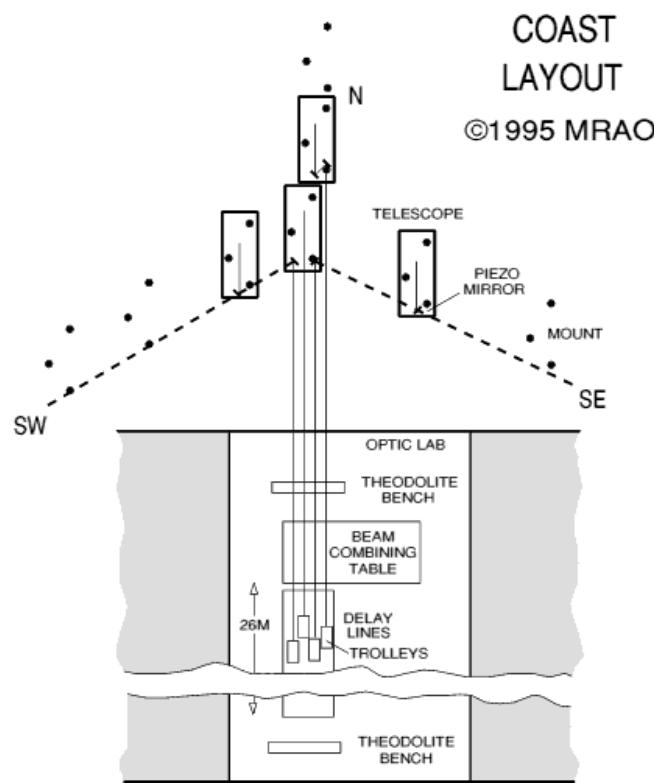


GI2T





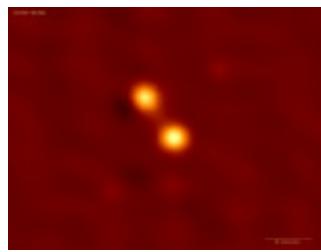
**Mark III
Stellar Interferometer**



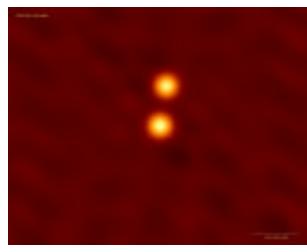
Cambridge Optical Aperture Synthesis Telescope (COAST)



Optical Synthesis Images of Capella



13 Sept. 1995



28 Sept. 1995